V*ist*A

Audiometric Exam Module User Manual

Patch ACKQ*3.0*3

June 2003

Department of Veterans Affairs
V*ist*A Health Systems Design & Development

Preface

Purpose

ACKQ *3.0*3 was designed to use a consistent, event-driven windows style clinical user interface to provide Audiologists and their staff with an easy way to enter, display, store and utilize the information obtained during the Audiometric exam of a patient.

Audience

The information in this manual is intended to aid practitioners in Audiology and Speech Pathology Service (ASPS) in the use of this software.

Benefits

Prior to this patch, there was no VA-wide availability of a way for practitioners to enter, store and view audiograms. Nor was there a central database for those readings. This patch introduces tools for these data entry, storage (both locally and centrally), and display capabilities. Upon structured entry of clinical hearing loss data through this package, a practitioner can immediately view an audiogram display and print a standard VA form 10-2364. An audiogram can also be printed for hard copy records or copied to the Windows clipboard for inclusion in other electronic documents.
Completed and signed audiograms are stored within the local **V*ist*A** system. They are also transmitted electronically to the Denver Distribution Center (DDC), where they are stored centrally and are available to facilitate the ordering and maintenance of hearing aids and accessories. This audiometric information is subsequently available whenever a practitioner places a REMOTE ORDER ENTRY SYSTEM (ROES) order.

Related Manuals

Audiometric Module ACKQ*3.0*3 Implementation Guide
Audiometric Module ACKQ*3.0*3 Technical Manual
Audiometric Module ACKQ*3.0*3 Security Manual

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Introduction

1. General Conventions Used

All examples shown in this document are of fictitious patients and information and are meant only to show display features, not actual readings.

Functionality included in ACKQ*3.0*3 is implemented through two software applications, one providing primarily data entry tools and one providing primarily display tools. These applications use a Microsoft Windows-style graphical interface with typical mouse navigation and field selection. End users can also access editable fields, tab pages and menu options through the use of short-cut key combinations (using the ALT key in combination with some other key). The key to use is shown underlined and capitalized (i.e. Print). Occasionally the user may need to hold down the ALT key to activate the appropriate underlining of characters.

Additional conventions specific to each application are described in the corresponding sections of this document.

2. Applications

AUDIOGRAM DISPLAY [ACKQROES3]
AUDIOMETRIC EXAM ENTER/EDIT [ACKQROES3E]

Audiometric Exam Enter/Edit

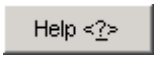
1. Enter/Edit Conventions

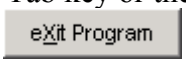
The material on the following pages describes procedures and functional features applying to the navigation and data entry of a patient's audiometric readings. Below are related conventions specific to this application.

The application window includes multiple tab pages. Be sure that the window is sized large enough to see the tabs at the top and the buttons at the bottom of the pages.
All fields that are disabled (cannot be edited) have a grayed appearance. All tab stops have been arranged so the user can proceed in a logical sequence through the editable fields by using the Tab key. When duplicate data entry fields exist for both the right and left ears, keyboard navigation generally progresses through all of the right ear fields first, followed by all of the left ear fields. Masking level fields are editable only if the threshold value entered for the corresponding frequency includes the masking symbol (*). Without that symbol, Tab-key navigation proceeds across the page from threshold to threshold, skipping the masking level. Indicate 'No Response' by entering the plus (+) symbol.
At any time the user can bypass the Tab-key sequence by using the mouse to click in the desired field. Pausing the cursor over an editable field displays a hint with the acceptable range of values. Inactivated or disabled fields are not reachable with either the Tab key or the mouse.
The 

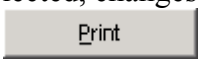
, 

, 

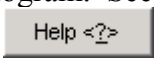
, 

and 

buttons appear on all tab pages.
The 

button is disabled until an editable field has been changed. When this button is selected, changes made within the currently viewable tab page are stored.
The 

button prints the currently viewable page.
If the 

button is clicked from any tab, the audiogram display for the selected record is invoked. It is not necessary for the record to be signed in order to display the audiogram. See the Audiogram Display section for further information.
The 

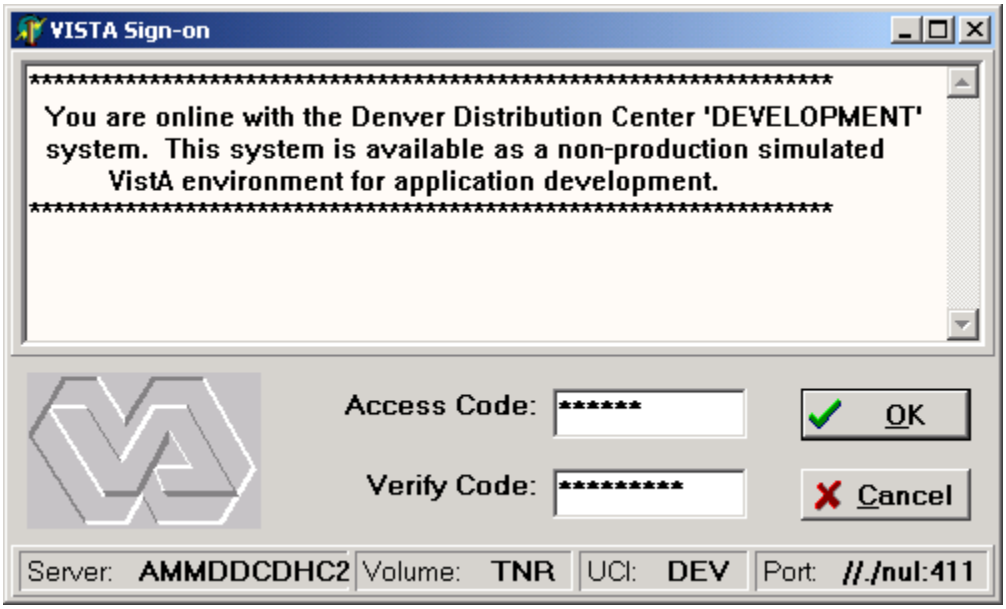
button displays help text specific to the currently viewable page.
The 

button exits from the *Audiometric Exam Enter/Edit* application.

2. Accessing the Enter/Edit

Typically, this application can be invoked from either CPRS or a stand-alone desktop shortcut (see instructions below). If either of these methods is desired but is not available, contact your facility's IRM Service to have the necessary installation or setup procedures completed.

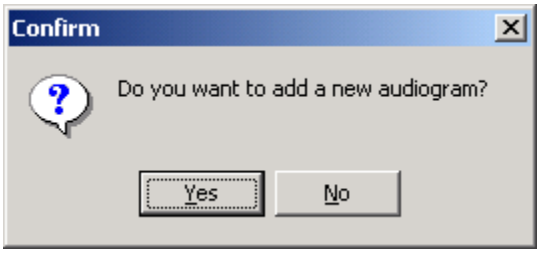
When invoking the application, if your facility does not have single signon enabled, you may need to log in with your local **V*ist*A** Access and Verify codes. A form similar to the following will appear.



In some cases, an end user may be set up for access to multiple broker environments. If that is the case, refer to Appendix C for further instructions.

Invoking From CPRS:

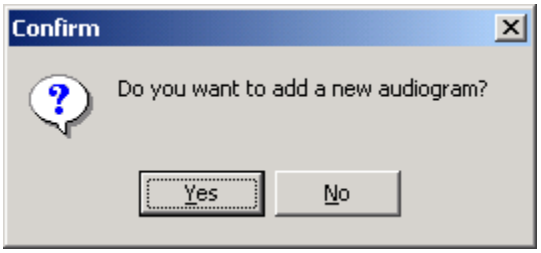
From the *Cover Sheet* in the CPRS application, click on the **Tools** menu. *Audiogram Edit* should be one of the options on that menu. Since a patient has already been selected in CPRS, you will not have to choose one.
At this point you will see the following question:



These instructions continue in the section *Continuing On.*

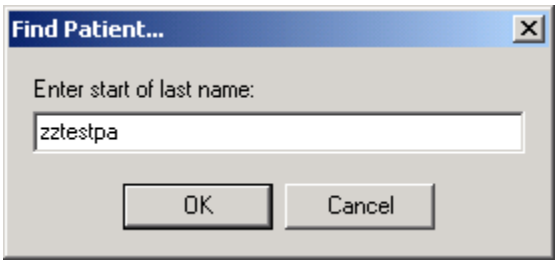
Invoking From the Desktop:

Double-click the desktop icon for the *Audiogram Edit* application. After logging in (if necessary). At this point you will see the following question:



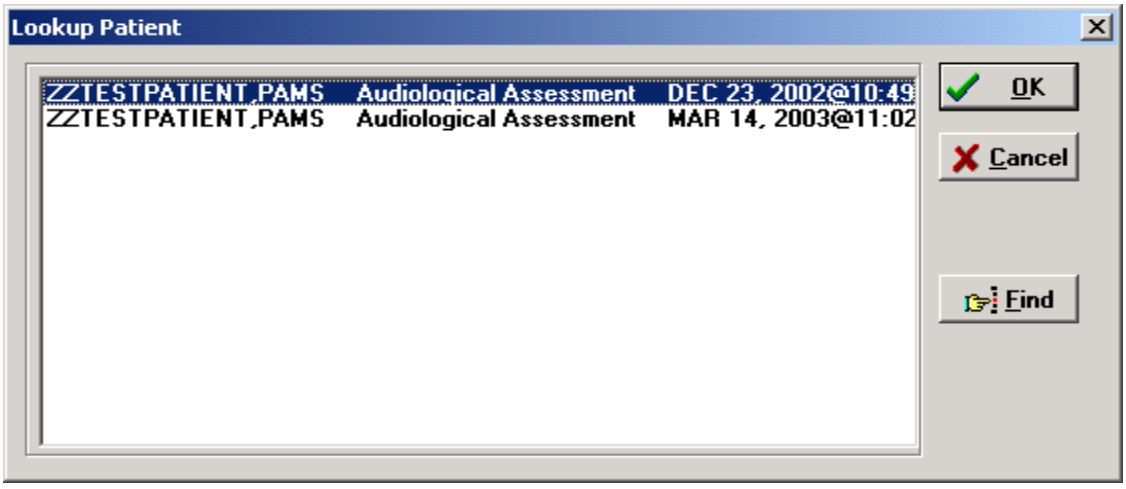
Your response will indicate whether the lookup for the patient is done in the PATIENT file or from the AUDIOMETRIC EXAM file.

If an existing audiogram is being entered, an existing exam will be selected from the AUDIOMETRIC EXAM file. Enter a few characters of the patients name in the following box.

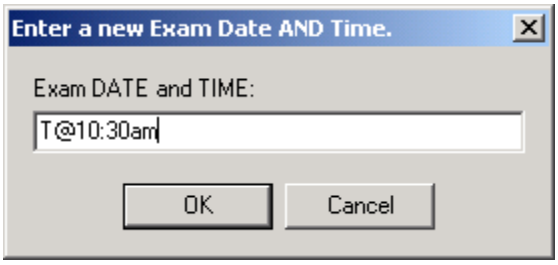


Continuing On:

If you are not entering a new record and more than one record exists for the patient, you will need to select the specific exam from a screen similar to the following, and continue the instructions in the Entry Tab Section.



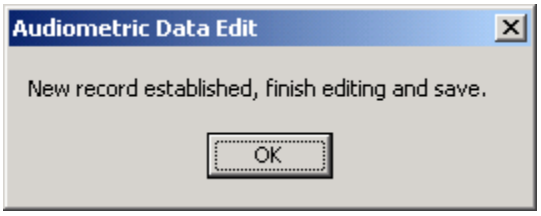
If you are entering a new record you will see the following prompt:



Note: Exam DATE *AND* TIME must be included in this space for a new record to be created.

You may enter any of the standard VA FileMan date/time formats (see Appendix E). At this point, a new record is set up in the file and the age of the patient is calculated.

You will then see the following verification message:



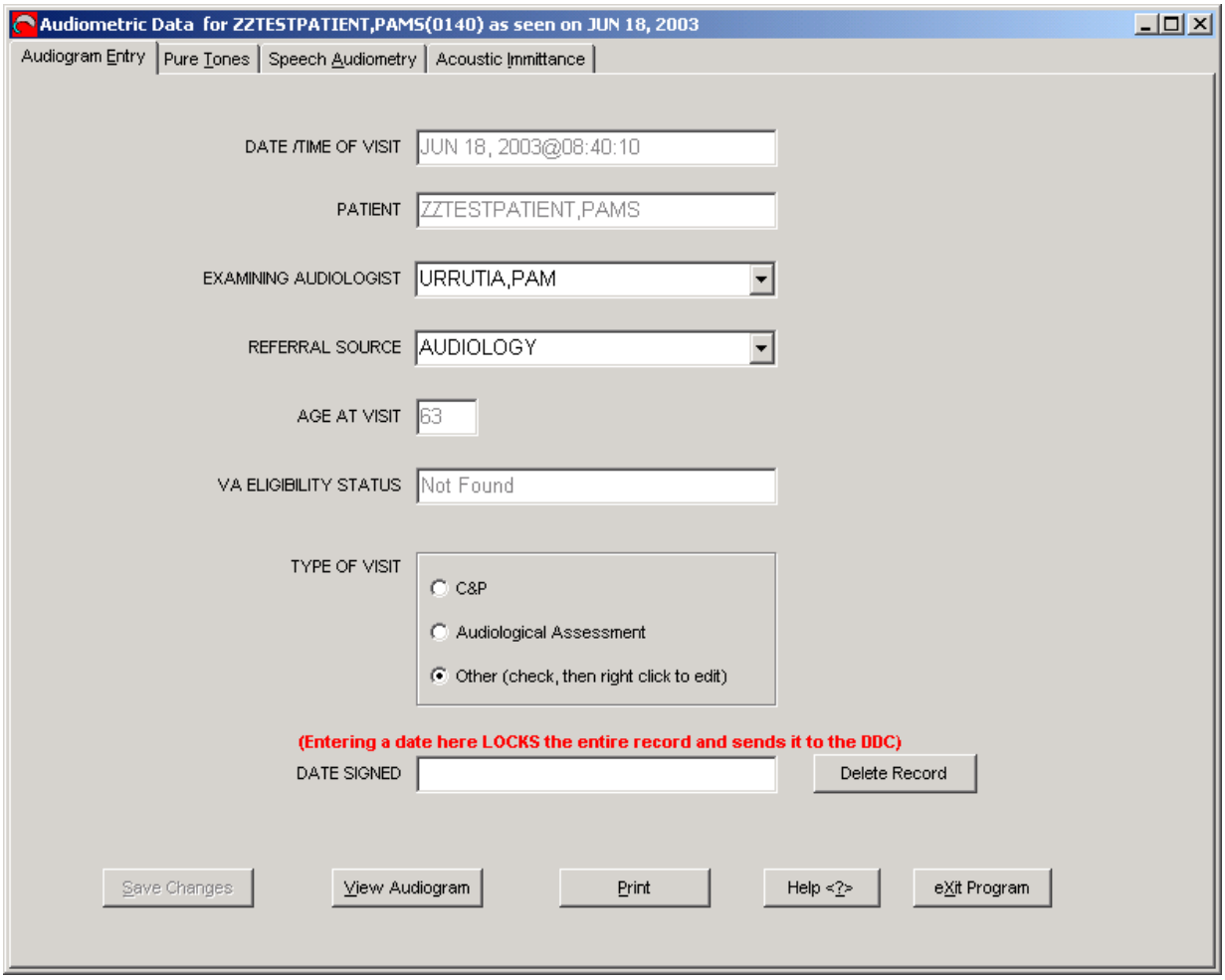
When this box is closed the introductory tab page is shown, and you will continue on to the *Audiometry Entry* tab, as shown below.

3. Audiometry Entry Tab

The following message may appear before the application window is opened to the initial tab page. If so, click *OK* to continue, and adjust as needed to see all parts of the form.

Continue to the next page.

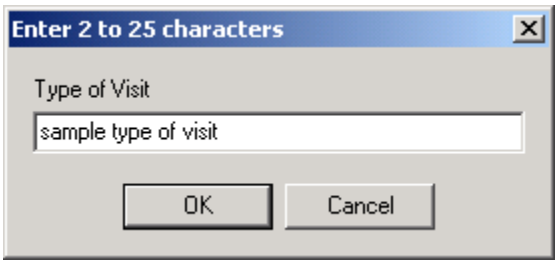
This page collects and displays basic patient and visit information. The DATE/TIME OF VISIT, PATIENT, AGE AT VISIT, and the VA ELIGIBILITY STATUS are calculated when the record is created and are not editable.



The EXAMINING AUDIOLOGIST field is selectable from the New Person file (#200). Both the name and the title of the person selected are displayed on the audiogram. Entry of the first few characters of the person's last name will assist in the lookup.

The REFERRAL SOURCE is selectable from the Hospital Location file (#44). Again, putting in the first few letters of the location will assist in the lookup. Naming for these locations may vary from facility to facility.

If "Other" is selected from the TYPE OF VISIT radio buttons, a free text entry of 2 to 25 characters is required and stored with the record.



The VA ELIGIBILITY STATUS is automatically taken from the Patient file(#2) and is: "Verified", "Pending" or "Pending Re-Verification".

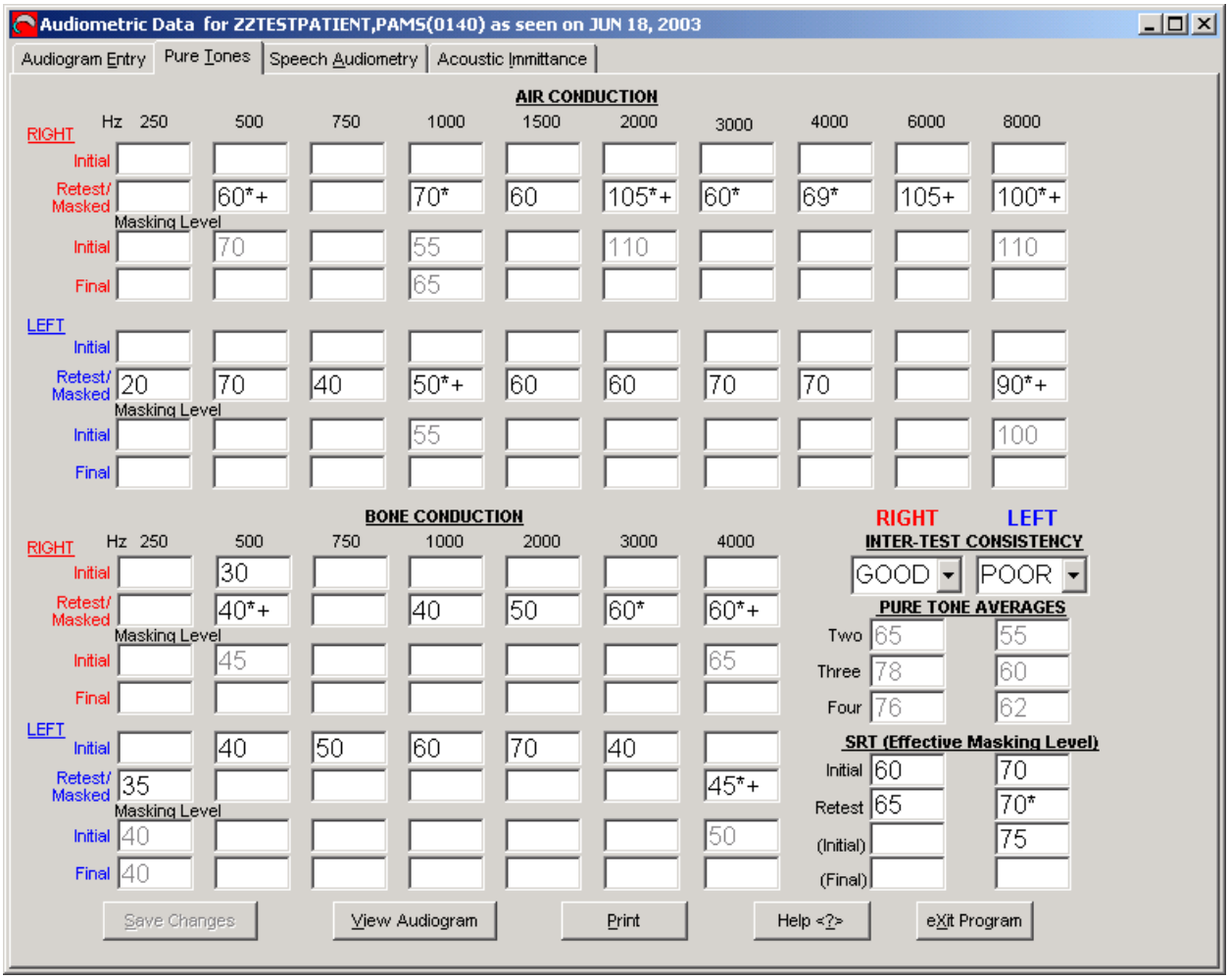
The record may be deleted as long as the DATE SIGNED field is empty. DATE SIGNED refers to the date that the information is verified as accurate, and once a date is entered into that field, the record is considered final and approved and the values are transmitted to the DDC database.

All fields become unavailable for further editing and the 

button disappears.

4. Pure Tones Tab

Click on the *Pure Tones* tab or enter ALT-T to make the *Pure Tones* tab active. This tab allows for entry of pure tone threshold values across a standard range of frequencies as a measure of hearing loss.



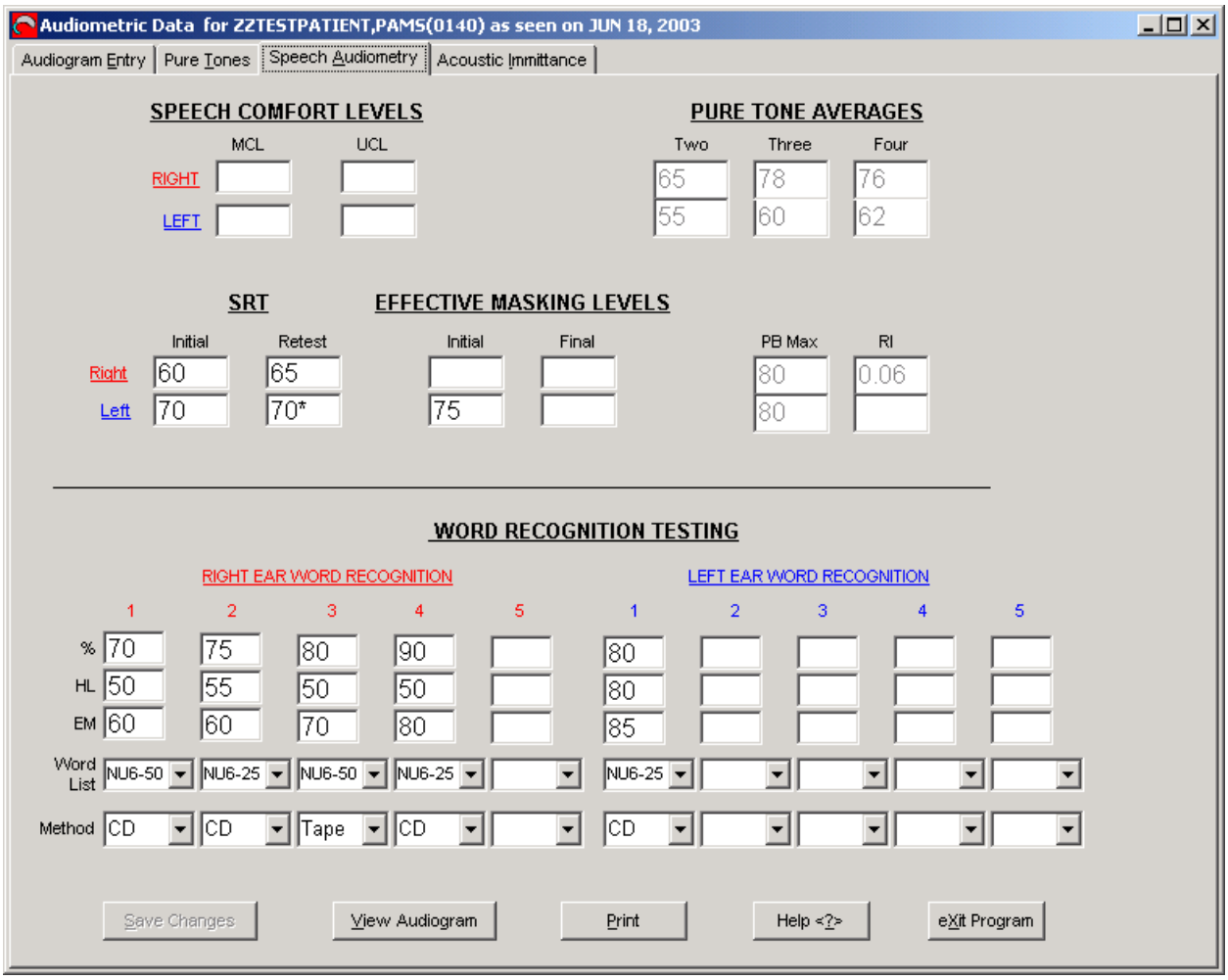
Threshold values for each frequency tested should be entered into the corresponding input field. If the cursor is paused over an editable field, a hint with acceptable values is displayed. Along with numerical values, the symbols '*' for 'masked' and '+' for 'no response' can be entered in the Retest/Masked. Disabled fields and calculated fields that do not require data entry are displayed in gray.

Masking level fields are editable only if the repeat threshold value entered for the corresponding frequency includes the masking symbol (*). Without that symbol, Tab-key navigation proceeds across the page to each successive frequency, skipping the masking level field.

Pure Tone Averages (PTA) are automatically calculated when sufficient information is entered. See Appendix D for further explanation.

5. Speech Audiometry Tab

Click on the Speech Audiometry tab or enter ALT-A to make the Speech Audiometry tab active. This tab displays the Pure Tone Averages (see Appendix D) from the Pure Tone tab and allows for entry of comfort levels, effective masking levels and word recognition information. The PB Max and PI/PB fields are calculated when sufficient information is entered. See Appendix B for further information.

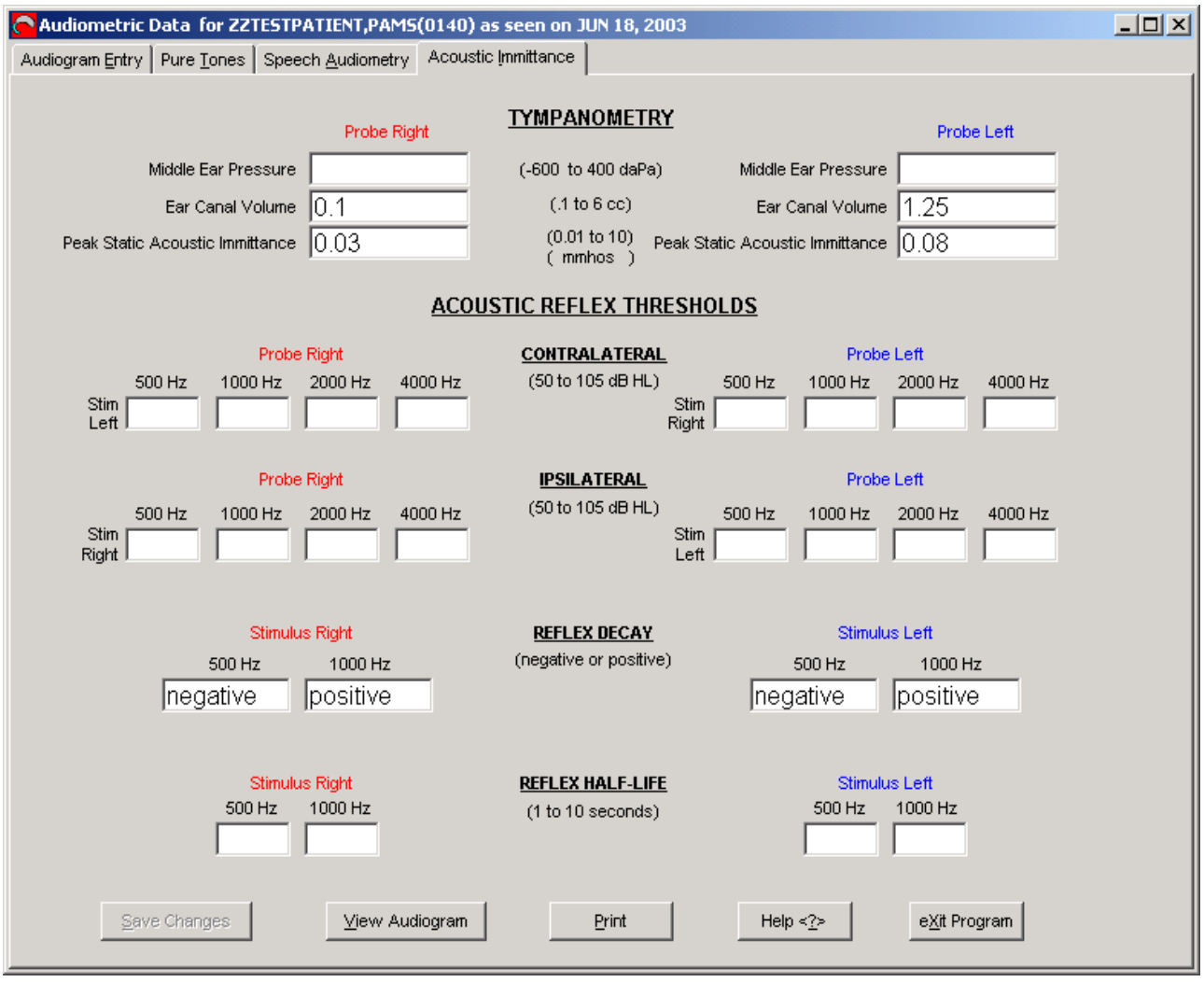


In the EFFECTIVE MASKING LEVELS section, INITIAL SRT refers to the first Speech Reception Threshold readings obtained during testing. Values obtained after masking, re-instructing the patient, or retesting for reliability purposes should be placed in the RETEST field. If data is in both fields, the retest data will be displayed on the graphic audiogram.

In the WORD RECOGNITION TESTING section, selections in the WORD LIST fields include both 25 and 50 word lists of the most commonly used lists.
If the cursor is paused over an editable field, a hint with acceptable values is displayed.
Whenever changes are saved, you will see a message similar to this one:

Acoustic Immittance Tab

Click on the Acoustic Immittance tab or enter ALT-I to make the Acoustic Immittance tab active.
This tab allows for entry of tympanometry and acoustic reflex information.

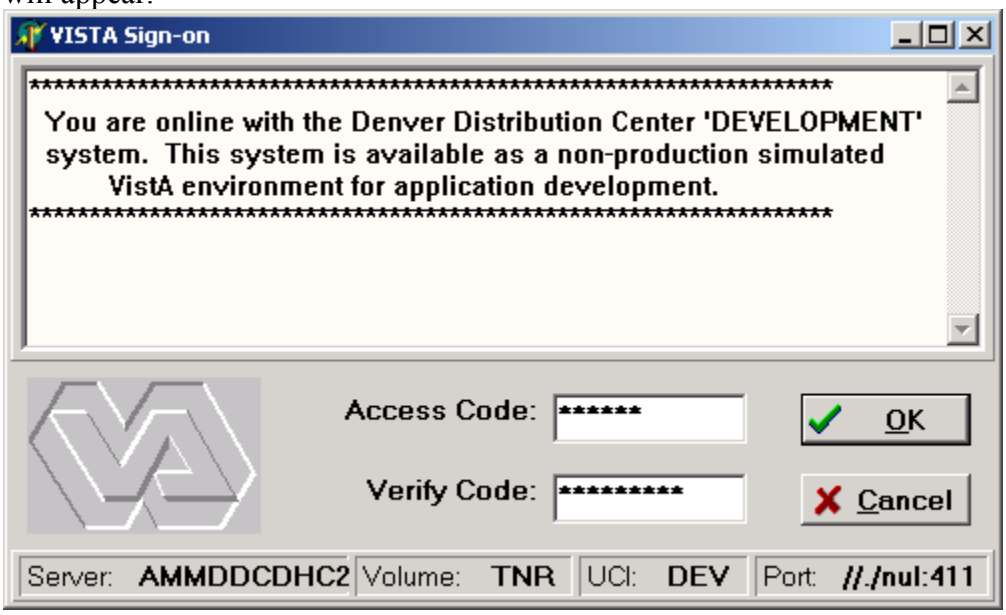


If the cursor is paused over an editable field, a hint with acceptable values is displayed.

The Audiogram Display

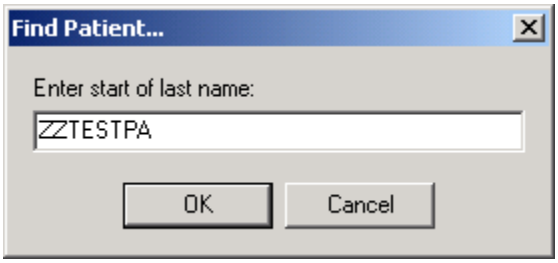
1. Accessing the Audiogram Display

Typically, this application can be invoked from either CPRS or a stand-alone desktop shortcut (see instructions below). If either of these methods is desired but is not available, contact your facility's IRM Service to have the necessary installation or setup procedures completed.
When invoking the application, if your facility does not have single signon enabled, you may need to log in with your local **V*ist*A** Access and Verify codes. A form similar to the following will appear.



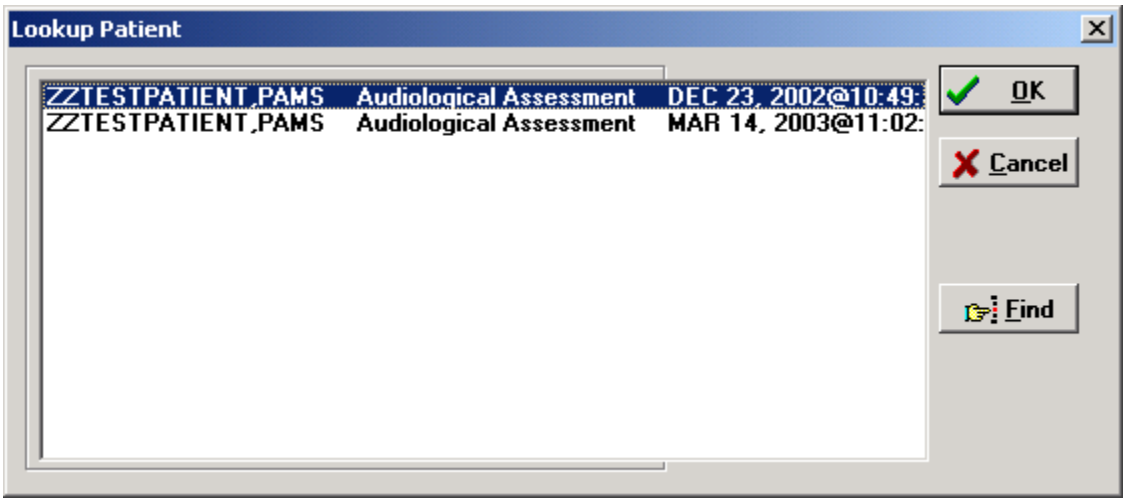
In some cases, an end user may be set up for access to multiple broker environments. If that is the case, refer to Appendix C for further instructions.

Invoking From the Desktop:
Double-click the desktop icon for the *Audiogram Display* application. After logging in to your local broker system (if necessary), enter the beginning of the patients name for faster lookup.



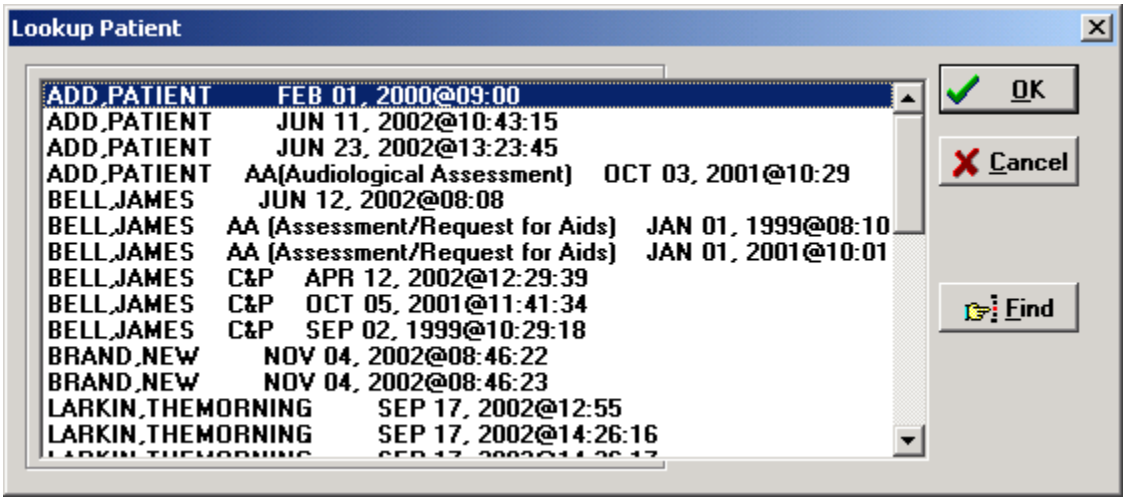
Invoking From CPRS:

From the *Cover Sheet* in the CPRS application, click on the **Tools** menu. *Audiogram Display* should be one of the options on that menu. Since a patient has already been selected in CPRS, you will not have to choose one.
Then select from a list of audiograms in the Audiometric Exam Data file (#509850.9) that matches the name entered. (Be sure the selected line has the yellow dots before pressing OK.



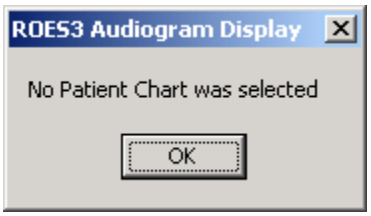
If a match was not found, you will receive the following notice:

Depending on how the application was entered, you may see the list of entries in the AUDIOMETRIC EXAM file.



At this point you may select, or click on the Find button to narrow the search again.

If no record is available or you do not select to view one, you will receive the following alert message.



The application will then terminate.

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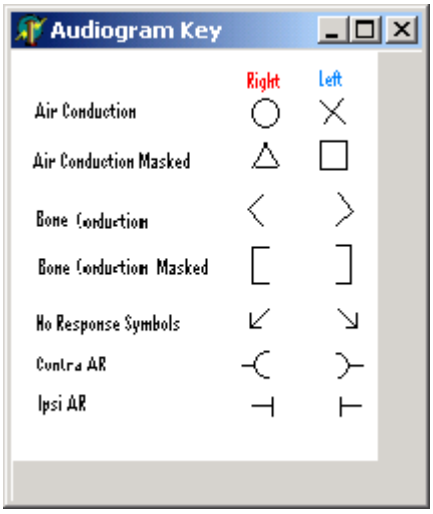
2. Display Conventions

All data in the display examples in this document is test data only and may not reflect normal readings from real patients. See Appendix A for an explanation of how values from the record are selected to appear on the graph when two readings are taken.
All menu options at the top of the display are available with short-cut keys also. If the index character does not appear underlined automatically, underlining will appear by holding down the ALT key. Pressing the ALT key and the underlined letter key will trigger the option. They are also available by holding down the right mouse key and selecting the action.
Access to a *Key*, showing symbol meanings, is available from the option selections.



The *Print All* option will print the entire display, as viewable at the time the option is selected.

The frequency, in Hertz (Hz), is represented logarithmically on the horizontal axis (abscissa) in values from 125 to 8000 Hz. The dashed lines for 750, 1500, 3000, and 6000 Hz are placed on the graph in the logarithmic position.

The hearing level (HL), in decibels (dB), is represented on the vertical axis (ordinate) in values from -10 to 120. See Appendix D for further information.

Pure Tone symbols are drawn on the display so that the midpoint of the symbol centers on the vertical ruling and the horizontal axis at the appropriate hearing level.

Bone-conduction symbols are drawn adjacent to, but not touching the frequency coordinate ruling and centered vertically at the hearing level. The symbol for the left ear is placed to the right of the vertical ruling and that for the right ear is to the left of the vertical ruling.

By selecting the *Copy 1* menu bar selection, the image referenced is copied to the Windows clipboard, from where it may be pasted into any picture-ready document (e.g., MS Word).

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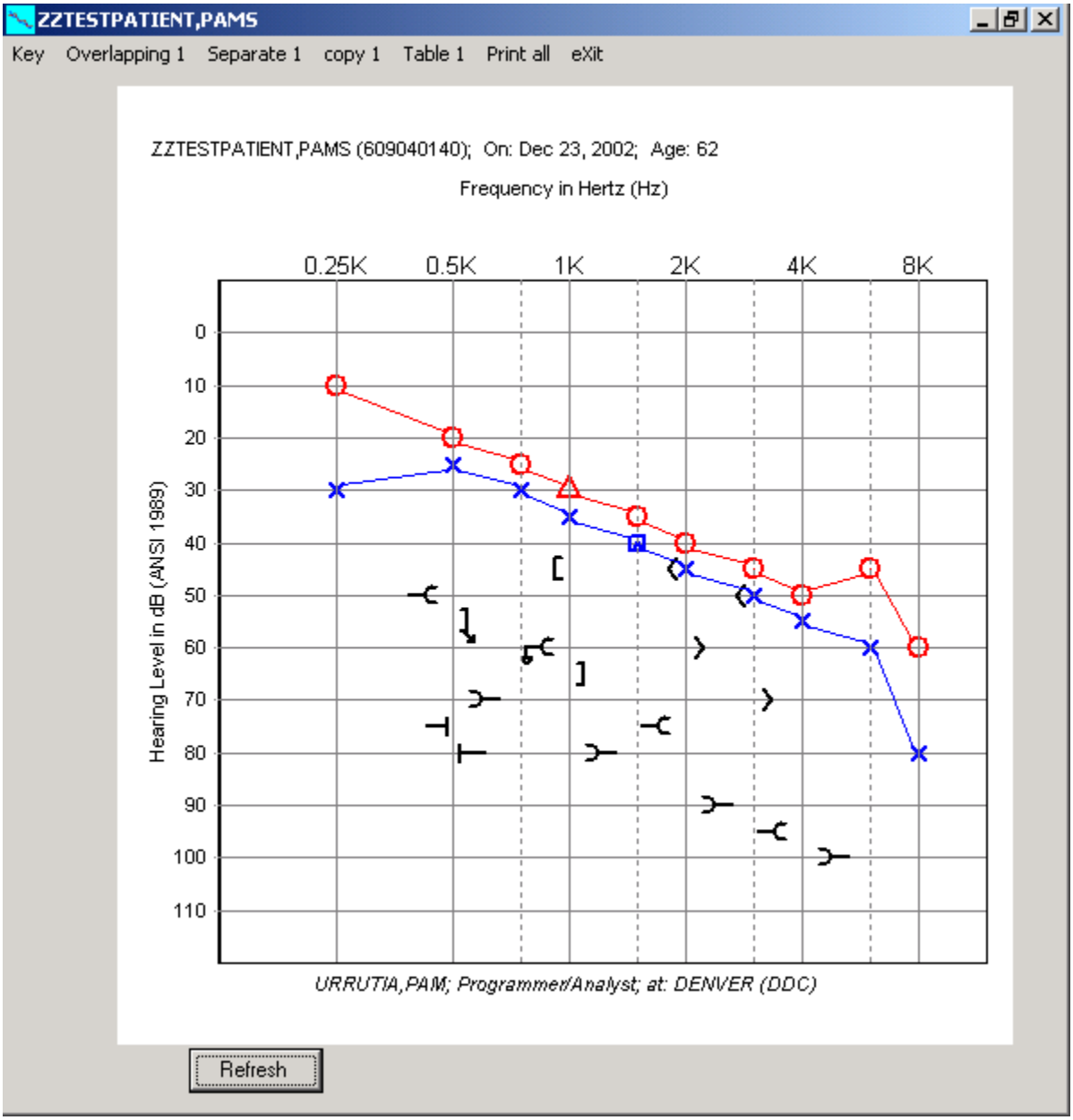
3. Main View

Audiogram in overlapping view

The default view shows the audiogram with overlapping right ear and left ear series. As is common practice, the right ear series displays in red and the left ear series in blue. Note the choices on the menu bar (see previous page on Display Conventions).



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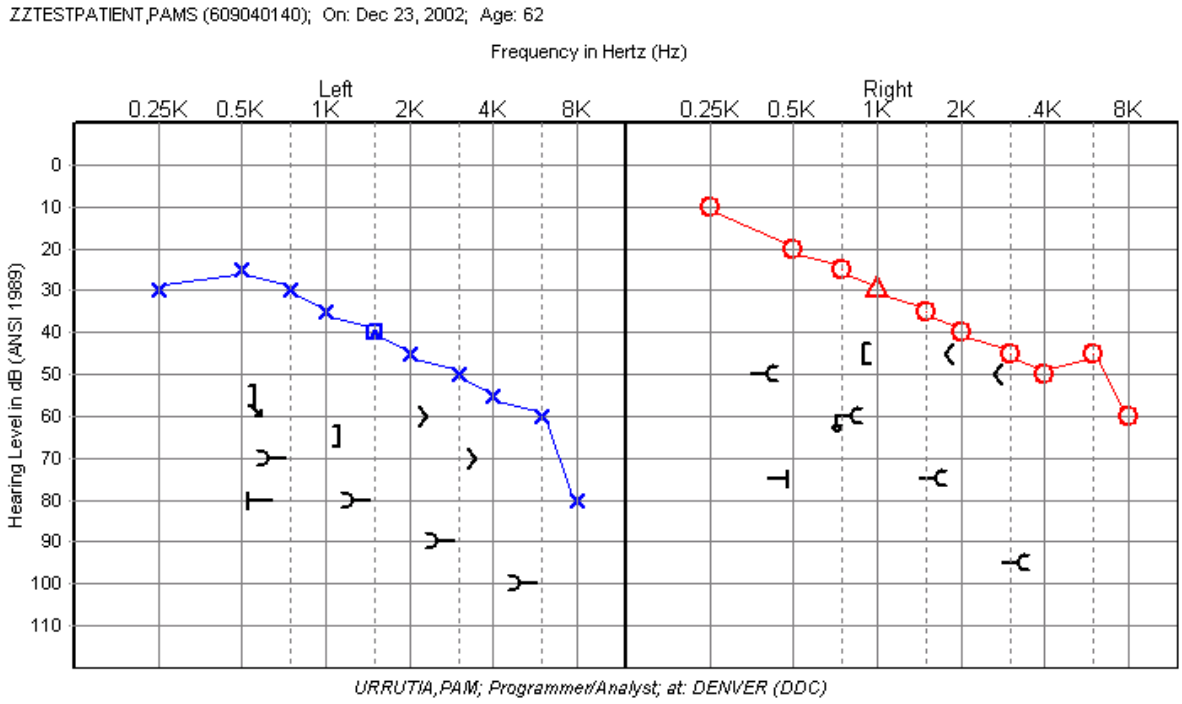
4. Separate View

The default view displays overlapping right- and left-ear measurements. Right and left readings may be separated for each audiogram displayed, as shown below. Use the *Separate 1* menu bar selections to accomplish this, and the *Overlapping 1* selections to return to the default view. All views display the date of the exam and age of the patient on that date above the audiogram. The name and title of the person who conducted the exam appear below the audiogram.



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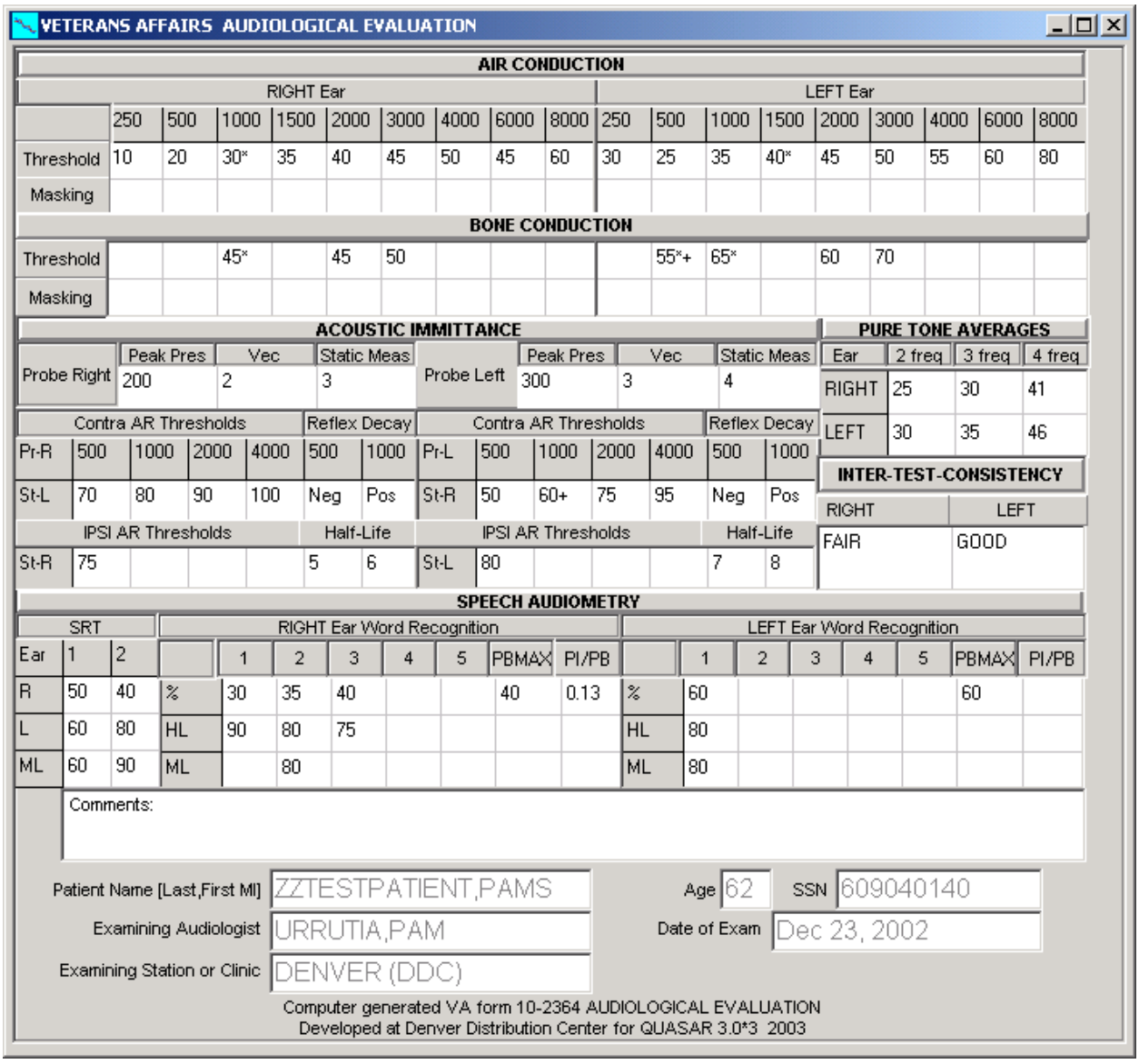
5. Viewing 10-2364

The *Table 1* menu bar selection, presents a computer-generated VA Standard Form 10-2364 containing the values from the selected audiogram. The values in the form intended only for printing or viewing. The use may enter a short comment in the field provided. This comment is not saved to the database, but only for printing the current view.



VETERANS AFFAIRS AUDIOLOGICAL EVALUATION

AIR CONDUCTION

	RIGHT Ear									LEFT Ear								
	250	500	1000	1500	2000	3000	4000	6000	8000	250	500	1000	1500	2000	3000	4000	6000	8000
Threshold	10	20	30*	35	40	45	50	45	60	30	25	35	40*	45	50	55	60	80
Masking																		

BONE CONDUCTION

Threshold			45*		45	50					55*+	65*		60	70			
Masking																		

ACOUSTIC IMMITTANCE

Probe Right	Peak Pres	Vec	Static Meas	Probe Left	Peak Pres	Vec	Static Meas
	200	2	3		300	3	4

	Contra AR Thresholds				Reflex Decay			Contra AR Thresholds				Reflex Decay	
	Pr-R	500	1000	2000	4000	500	1000	Pr-L	500	1000	2000	4000	500	1000
	St-L	70	80	90	100	Neg	Pos	St-R	50	60+	75	95	Neg	Pos

	IPSI AR Thresholds				Half-Life		IPSI AR Thresholds				Half-Life	
St-R	75				5	6	St-L	80			7	8

PURE TONE AVERAGES

Ear	2 freq	3 freq	4 freq
RIGHT	25	30	41
LEFT	30	35	46

INTER-TEST-CONSISTENCY

RIGHT	LEFT
FAIR	GOOD

SPEECH AUDIOMETRY

SRT			RIGHT Ear Word Recognition								LEFT Ear Word Recognition							
Ear	1	2		1	2	3	4	5	PBMAX	PI/PB		1	2	3	4	5	PBMAX	PI/PB
R	50	40	%	30	35	40			40	0.13	%	60					60	
L	60	80	HL	90	80	75					HL	80						
ML	60	90	ML		80						ML	80						

Comments:

Patient Name [Last,First MI] ZZTESTPATIENT,PAMS Age 62 SSN 609040140

Examining Audiologist URRUTIA,PAM Date of Exam Dec 23, 2002

Examining Station or Clinic DENVER (DDC)

Computer generated VA form 10-2364 AUDIOLOGICAL EVALUATION
Developed at Denver Distribution Center for QUASAR 3.0*3 2003

The options to *copy*, *print* or *exit* this form are available by clicking on the *right mouse button*, while the cursor is over the form.

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Glossary

Acronyms

AC Air Conduction

AR Acoustic Reflex

ASPS Audiology & Speech Pathology Service

BC Bone Conduction

C&P Compensation and Pension

CAR Contralateral Acoustic Reflex

CNC Consonant Nucleus Consonant

dB Decibel

DDC Denver Distribution Center

EM Effective Masking

HL Hearing Level

Hz Hertz

IAR Ipsilateral Acoustic Reflex

MCL Most Comfortable Loudness

ML Masking Level

NR No Response

NU Northwestern University

PI/PB Performance Intensity-Phonetically Balanced words

Pr-L Probe Left

Pr-R Probe Right

PSAS Prosthetics & Sensory Aids Service

PTA Pure Tone Average (see Appendix D)

SAT Speech Awareness Threshold

SRT Speech Reception Threshold

UCL Uncomfortable Loudness

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Appendices

A: Determination of Series Values for Display

Some of the key rules applied in preparing series values for display in the *Audiogram Display* application are as follows:

Both the initial and final thresholds and their respective masking levels are obtained.
If the repeat threshold indicated a 'No Response' (+), there will be a gap in the series.
The initial threshold value for the series will be replaced with the repeat value for any of the following reasons:

If the repeat value is masked and the initial is not.

If the repeat value is not masked, and the repeat is less than the initial.

If the initial reading does not have a value.

B: Calculation Of PB MAX And PI/PB

Calculation of PB MAX and PI/PB values in the *Audiometric Exam Enter/Edit* application is based on specific industry-standard formulae established for these measurements. Basic descriptions of some of these formulae are as follows:

PB MAX is the maximum percentage from the word recognition testing.

PB MIN is the minimum percentage from the word recognition testing.

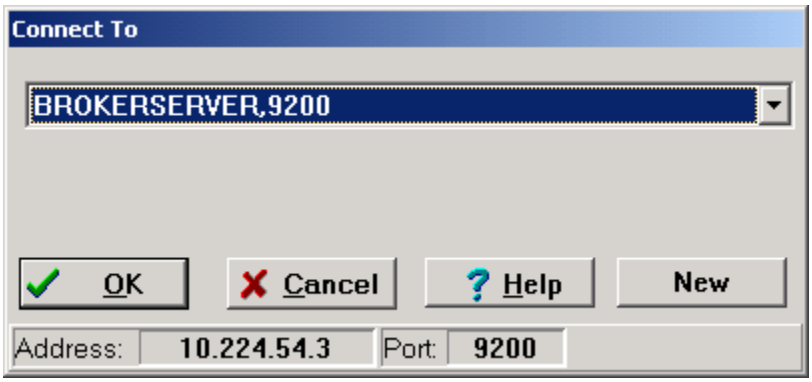
PI/PB is an indice of possible retrocochlear pathology. It is calculated from the formula: (PB MAX - PB MIN)/(PB MAX).

The PI/PB index will assess multiple scores and levels in one ear. The calculation will occur only when a second score obtained at a higher presentation level, is poorer than a prior score at a lower presentation level.

The result is always a value less than 1.0.

C: If You Have Access To Multiple Broker Environments

If you have additional access to a training or development broker environment, you may need to select the environment you want to use from a form like the following:



By selecting the correct server name from the drop down list, you will access the correct environment. (Using the down arrow key will also move from one selection to another)

See your local IRM or ADPAC to obtain the correct server name.

D: Calculation of Pure Tone Averages

Pure Tone Averages displayed in the *Audiometric Exam Enter/Edit* application are automatically calculated and supplied when sufficient information is entered. At each level, the numbers used are the ones that would appear on the graph for that level.

The formulas used are:

PTA TWO = Average of the lowest two readings from 500, 1000, and 2000 Hz.

PTA THREE = Average of 500, 1000 and 2000 Hz.

PTA FOUR = Average of 1000, 2000, 3000 and 4000 Hz.

E: VA FileMan Date/time Formats

Examples of Valid Dates:

JAN 20 1957 or 20 JAN 57 or 1/20/57 or 012057

T (for TODAY), T+1 (for TOMORROW), T+2, T+7, etc.

T-1 (for YESTERDAY), T-3W (for 3 WEEKS AGO), etc.

If the year is omitted, the computer uses CURRENT YEAR.

Two-digit year assumes no more than 20 years in the future, or 80 years in the past.

If only the time is entered, the current date is assumed.

Follow the date with a time, such as JAN 20@10, T@10AM, 10:30, etc.

You may enter a time, such as NOON, MIDNIGHT or NOW.

You may enter NOW+3' (for current date and time Plus 3 minutes

*Note--the Apostrophe following the number of minutes)

Note: Time is REQUIRED in this response.

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